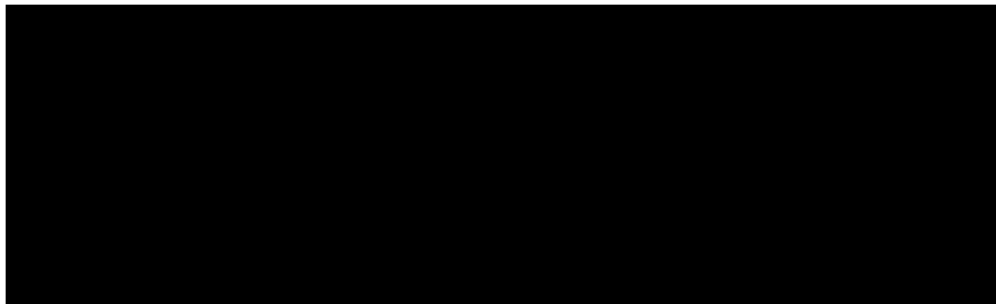


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DECLASS REVIEW by NIMA/DOD

HANDBOOK  
Operation and Service  
Instructions  
RAPID ACCESS FILM PROCESSING  
CONSOLE MODEL RAPC 5-250  
for

[REDACTED]

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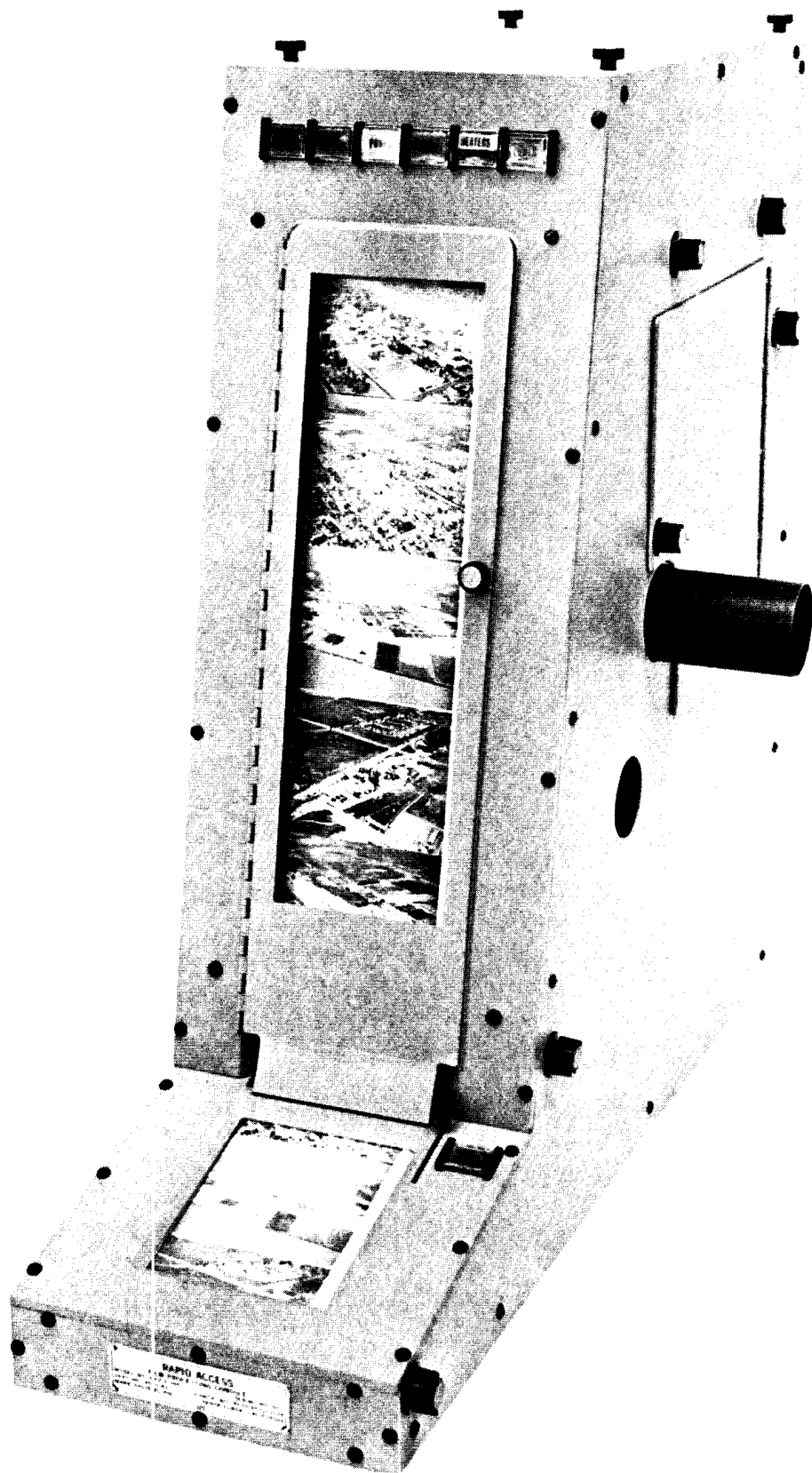
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FRONTISPIECE-RAPID ACCESS FILM PROCESSING CONSOLE.

SECTION I.  
INTRODUCTION AND DESCRIPTION

1-1. INTRODUCTION

1-2. This handbook contains descriptive data and instructions for the operation and servicing of the Rapid Access Film Processing Console. The processing console functions as the processing and display portion of an airborne CRT film recording and display system. The equipment was produced by [REDACTED] for use with a [REDACTED] #7SK-4361 which is a part of the [REDACTED] designated as DPD-2, herein called Recorder.

1-3. The Rapid Access Film Processing Console is self-contained and operationally controlled from the front panel. On/off control for the film drive in the [REDACTED] recorder is provided.

1-4. PURPOSE

1-5. The Rapid Access Film Processing Console, herein referred to as the Rapid Film Processor, is intended for use in a C-130B aircraft. It is designed to accept [REDACTED] film emulsion, or its equivalent, coated on a white opaque photographic paper (hard copy), process the film, present the film for viewing while simultaneously drying it, store the film in a slack box, and recall the film from the slack box upon command. A review platform is provided for examining the film as it is recalled from the slack box.

1-6. CHARACTERISTICS

1-7. Following is a list of the characteristics of the Rapid Film Processor.

OPERATIONAL CONTROLS

Operation: front panel mounted control switches and side mounted manually operated loading and threading knobs.

Control switches include:

1. Power
2. Heaters (processing chemicals)
3. Dryer
4. Pumps
5. Operate

6. Purge
7. Full (Slack Box full indicator and reset)
8. Tank latch release switch (inside tank access door); red coded
9. Takeup control

Manual knobs include:

1. Dancer latch - yellow
2. Chemical tank access door - grey
3. Tank locking knobs (2) - red
4. Pressure roller release (2) - green

Operation Indicators: Indicator lamps are integral with each control switch, excluding the tank latch release switch and takeup motor control. Manual knobs are color coded.

Lamps are colored as follows:

1. Power - red
2. Heaters - yellow and green (green indicates ready to process)
3. Dryer - blue
4. Pumps - yellow
5. Operate - dark green
6. Purge - red
7. Slack box full - red

Power Input:

Standby - 115V, 400 cycle, single phase, 1.5 amp,  
28VDC, 1 amp

Operate - 115V, 400 cycle, single phase, 10 amp,  
28VDC, 2 amp

Lubrication - as per section IV, at manufacture for 500  
hours of operation

Environmental Conditions -

Ambient temperature - 32° -120°F

Altitude - sea level to 20,000 feet

Slack Loop Storage Capability - 20 feet or 2 minutes  
operating time

Slack Loop Recall Rates - 0 to 8 inches per second



Film Motion - continuous, at a nominal fixed rate of 2 inches per second. Subject to d.c. command signal from servo amplifier which synchronizes rate with output rate of recorder.

Dump Box Capacity - in excess of 50 feet of 5 inch film

Processing Capability - at least 250 feet of 5 inch [REDACTED] film or paper, without chemical replenishment

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Takeup Drive Tension - 3 to 4 pounds

Processing Time - 5 seconds total

Keeping Quality - Semi-archival (minimum of one year)

Weight - approximately 90 pounds

Chemical Requirements -

Developing Solution - 1 quart [REDACTED] Developer No. 238B

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Clearing Solution - 1 quart [REDACTED] Clearing Solution No. 193

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Rinse Solution - 1 quart [REDACTED] Rinse Solution No. 174B

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# 1-8. DESCRIPTION (see Frontispiece and Figures 1-1 through 1-9)

The Rapid Film Processor consists of three major sub-assemblies:

1) the main console, 2) the processing assembly, and 3) the electronic chassis assembly. The principal components contained within each of these subassemblies and their functions and descriptions are tabulated in the following:

Main Console - Functions as the basic structural member of the processor and support for processing assembly and the electronic assembly.

<u>Figure</u>	<u>Callout</u>	<u>Nomenclature</u>	<u>Function and/or Description</u>
1-2	1	Bellows	Light tight passage between recorder and processor.
1-8	1	Limit Switch, upper	Automatic shutoff for recorder if film input from recorder exceeds transport capability of processor

<u>Figure</u>	<u>Callout</u>	<u>Nomenclature</u>	<u>Function and/or Description</u>
1-8	2	Limit Switch, lower	Automatic shutoff if film input to processor stops. (Does not de-activate recorded film drive.)
1-1	1	Control Panel	
1-1	1	a.Power Switch	Main power switch for entire processor
1-1	2	b.Heater Switch	Warmup switch for processing chemicals
1-1	3	c.Pumps Switch	For operating pumps independently of other processor functions
1-1	4	d.Dryer Switch	Activates dryer blowers and heater for warmup previous to processing
1-1	5.	e.Operate Switch	Activates all normal processor functions
1-1	6.	f.Purge Switch	Purge applicators of processing chemicals previous to shutdown.
1-1	10	Review Station	Permits examination and annotation of film after recall from slack box.
1-1	7	Viewer/dryer door	Provides access to film for threading
1-1	8	Slack Box Full Indicator Lamp and Switch	Provides warning that 20 foot capacity of slack box has been exceeded. Contains reset switch.
1-1	9	Takeup Control	Controls film recall rate from slack box.
1-2	1	Tank locking knobs	To retain chemical tank
1-2	2	Air Inlet	Dryer air supply
1-2	3	Air Exhaust	To discharge dryer air
1-2	4	Tank door	Access to chemical supply tank
1-2	5	Pressure Roller release	Retract metering roller pressure roller for threading
1-2	6	Pressure Roller release	Retract takeup roller pressure roller for threading

<u>Figure</u>	<u>Callout</u>	<u>Nomenclature</u>	<u>Function and/or Description</u>	
1-2	7	Loop Sensor Knob	To latch loop sensor roller in down position for threading	
1-2	8	Connector J3	Power input to processor	
1-2	9	Connector J4	Interlock connector to [REDACTED] Recorder	STATINTL
1-2	10	Rear panel	Dust cover and support for electronic chassis	
1-7	1	Film Metering Roller	Drives film at rate proportional to servo amplifier output command signal	
1-7	2	Film Metering Roller Drive Assembly	Motor and gear train to rotate metering roller	
1-7	3	Pressure Roller	For metering roller	
1-7	4	Film Takeup Roller	Recall film from slack box	
1-7	5	Film Takeup Roller Drive Assembly	Motor and gear train to rotate takeup roller	
1-7	6	Slip Clutch	For film takeup roller	
1-7	7	Stepping Switch Assy.	Circuitry for activating slack box full lamp	
1-7	8	Takeup Motor Potentiometer	To vary film recall speed	
1-7	9	Slack box	Stores processed film	
1-8	3	Spring	For loop sensor roller	
1-8	4	Roller	Loop Sensor	
1-8	5	Idlers	Fixed center rollers in loop sensor mechanism	
1-9	6	Potentiometer	Provides d.c. command signal to servo amplifier	
1-10	7	Rack and pinion	To actuate potentiometer	
2-1	11	Bellows	A light tight passage between processor and recorder	

Processing Assembly -

<u>Figure</u>	<u>Callout</u>	<u>Nomenclature</u>	<u>Function and/or Description</u>
1-6	1	Film Platen	Support for film during processing
1-3	1	Applicator Assembly Plate	Mounting plate for applicators. Hinged for threading. Contains adjustable applicator pressure springs.
1-3	7	Retractor	Retract applicator from film
1-4	1	Solenoid valve	Purge applicators at the completion of processing
1-4	2	Pressure Screws	Adjust pressure on applicators
1-6	2	Developer Applicator	} Apply appropriate processing chemical to film
1-6	3	Clearing Applicator	
1-6	4	Rinse Applicator	
1-5	1	Connector P1	Provides power from console to pump motor, solution heaters, thermistor, purge solenoids and tank latch solenoids
1-3	2	Thumbscrews	Secure applicator support plate in operating position
1-4	3	Pump motor	Drives pumps through gear train
1-4	4	Tank latch	Supports solution tank during installation and removal
1-4	5	Tank latch solenoid	Release tank latches
1-4	6	Pump drive assembly	Gear train from pump motor
1-5	2	Heaters	Heat processing chemicals to operating temperature
1-5	3	Thermistor Housing	Housing for processing solution temperature sensing element
1-5	4	Pumps	For processing solution circulation
1-3	3	Solution Tank	Contains the three processing solutions used to rapid process film

<u>Figure</u>	<u>Callout</u>	<u>Nomenclature</u>	<u>Function and/or Description</u>
1-6	5	Applicator Pins	Locate applicators in position on film platen
1-6	6	Standoffs	Retain thumbscrews
1-6	7	Tubing	To circulate chemicals
1-3	5	Yoke	Retain applicator on applicator pins
1-3	6	Springs	Maintain contact between film and applicator
1-3	2	Screw	Applicator pressure adjustment
1-5	6	Screw, tank clamp	Clamps and retracts tank
1-5	5	Pins	Align tank with baseplate
1-5	4	Baseplate	Supports pump drive unit, heaters, pumps

Electronic Chassis Assembly - The electronic chassis accepts power from the aircraft and provides the power input and the control circuitry for the electronic components previously described.

1-9	1	Film Drive Motor Amplifier	Provides power to the film metering roller such that film speed is synchronized with the film recorder and proportioned to the dancer assembly potentiometer position.
1-9	2	Temperature Control Module	Processing solution temperature control circuitry
(not shown - located under film drive motor amplifier)		Temperature Potentiometer	Processing solution temperature control circuitry
1-9	3	Functional Control relays K1 and K2	Heaters and Operate Relays
1-9	4	Takeup Motor Amplifier	Provides power to take up motor. It is proportioned to manually controlled potentiometer.
1-9	5	Transformers	For low power heating
1-9	6	Fuses	Overload protection
1-9	7	Connector	Between electronic chassis and main console

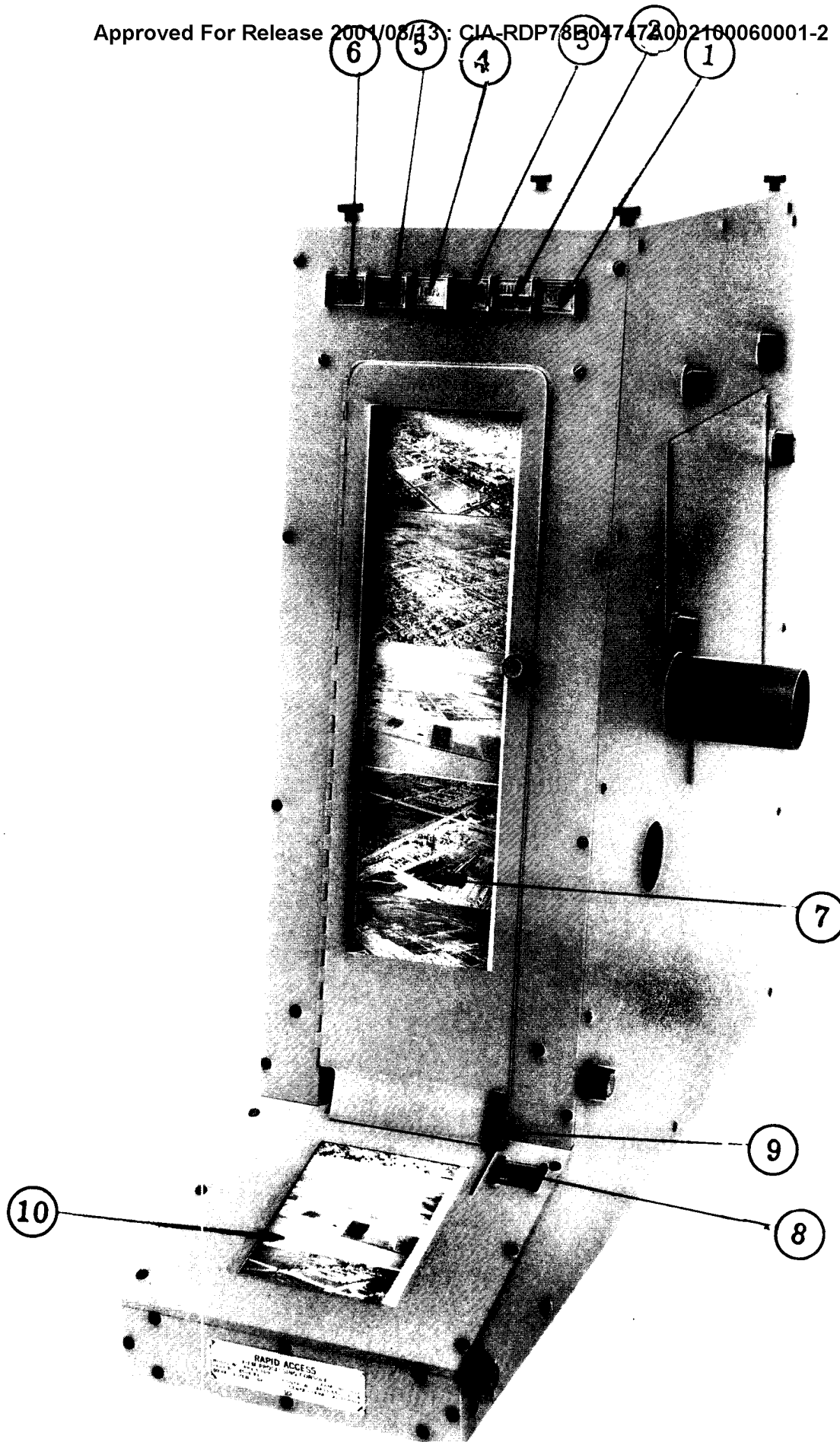


FIGURE 1-1 CONSOLE-OPERATIONAL CONTROLS

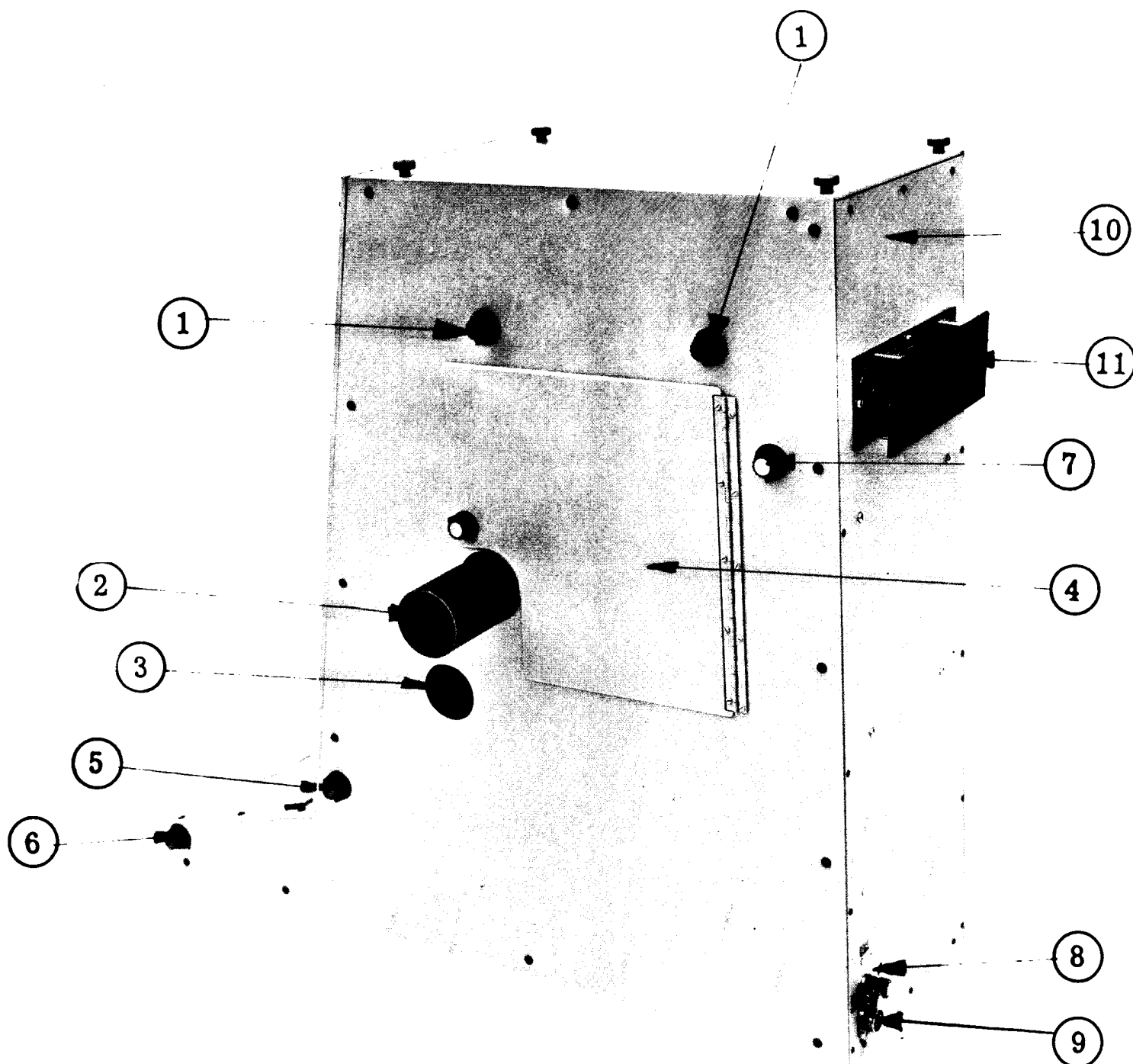


FIGURE 1-2 CONSOLE SIDE AND REAR

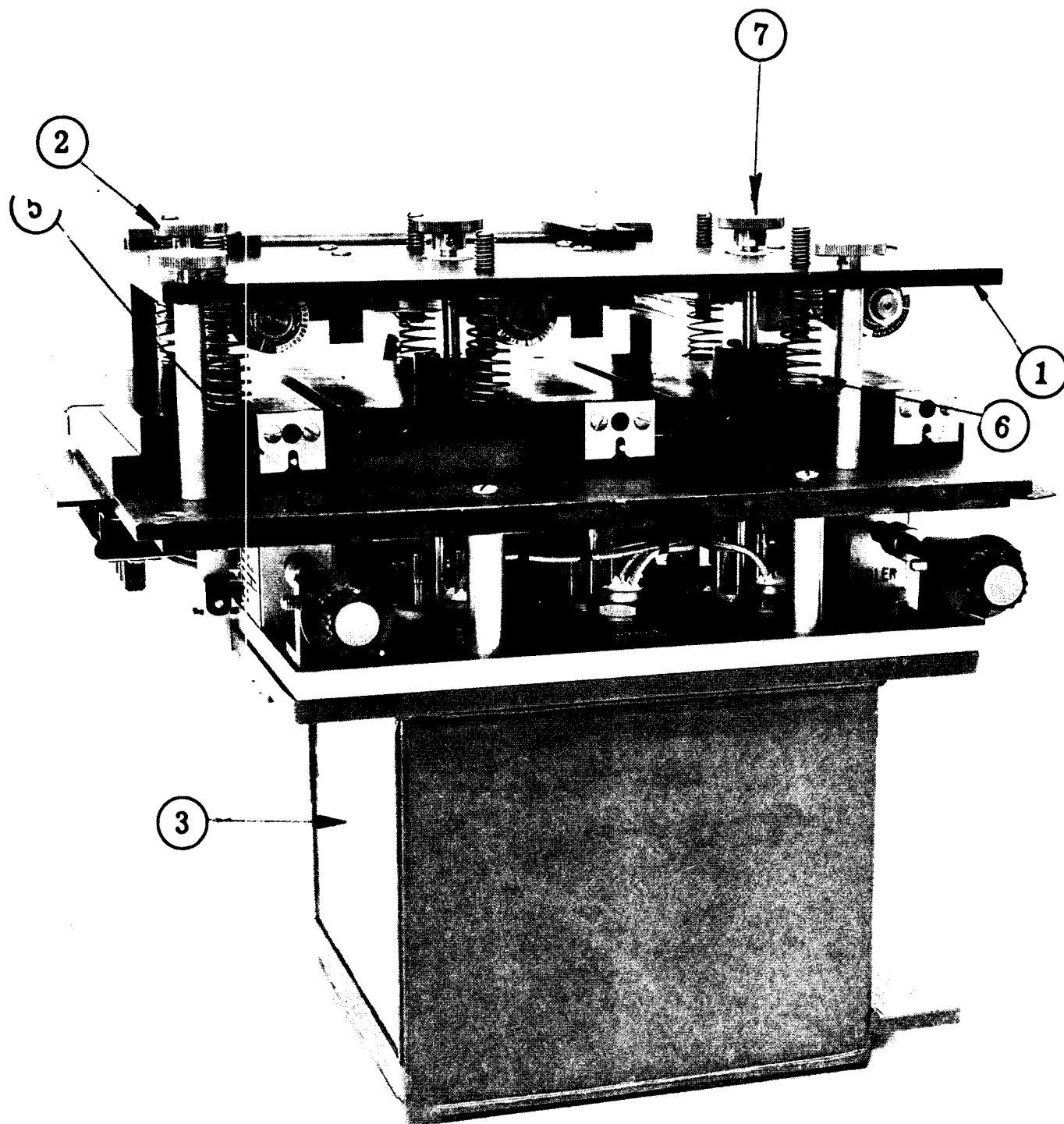


FIGURE 1-3 PROCESSING ASSEMBLY ( APPLICATORS AND TANK IN PROCESSING  
POSITION - VIEW FROM OPERATOR SIDE)



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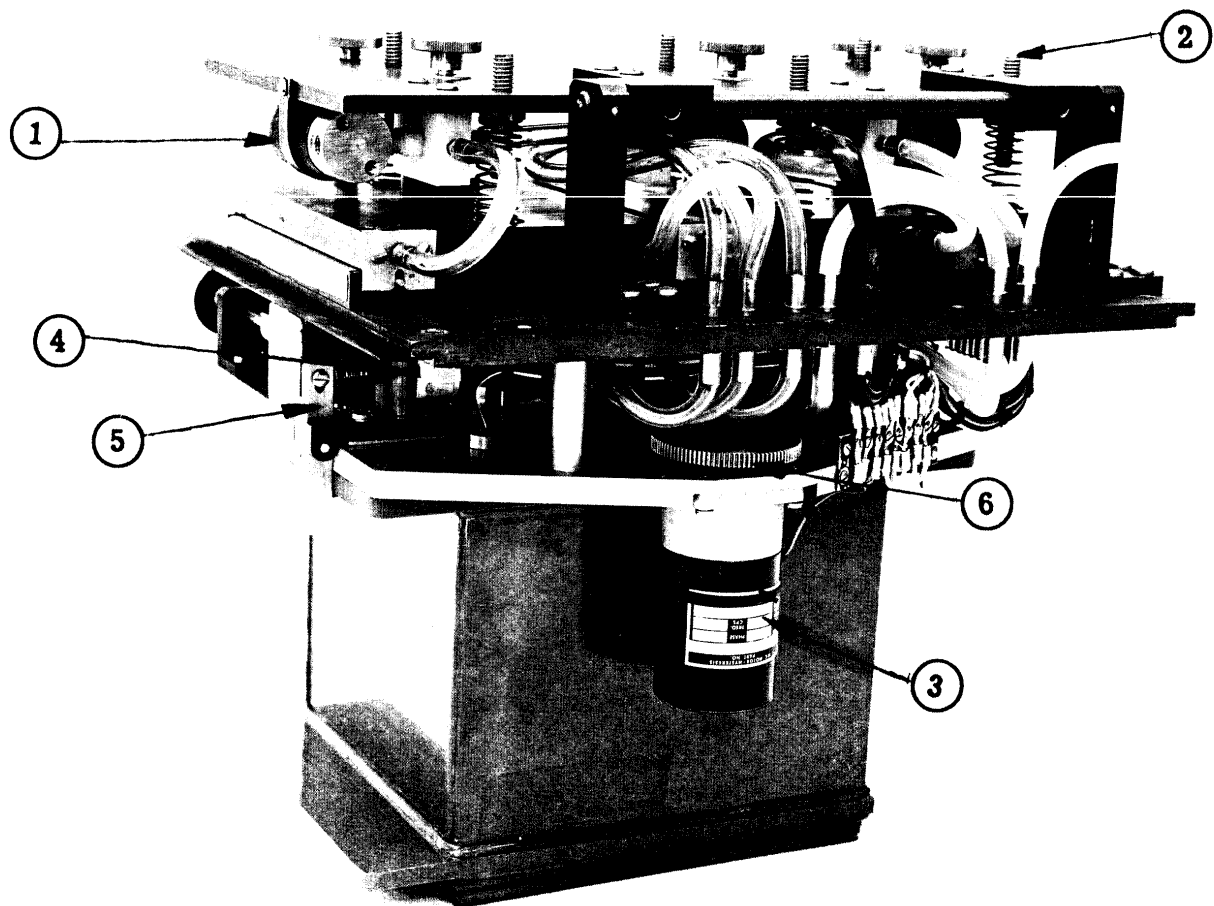


FIGURE 1-4 PROCESSING ASSEMBLY (APPLICATORS AND TANK IN OPERATING POSITION -VIEW FROM OPPOSITE SIDE)

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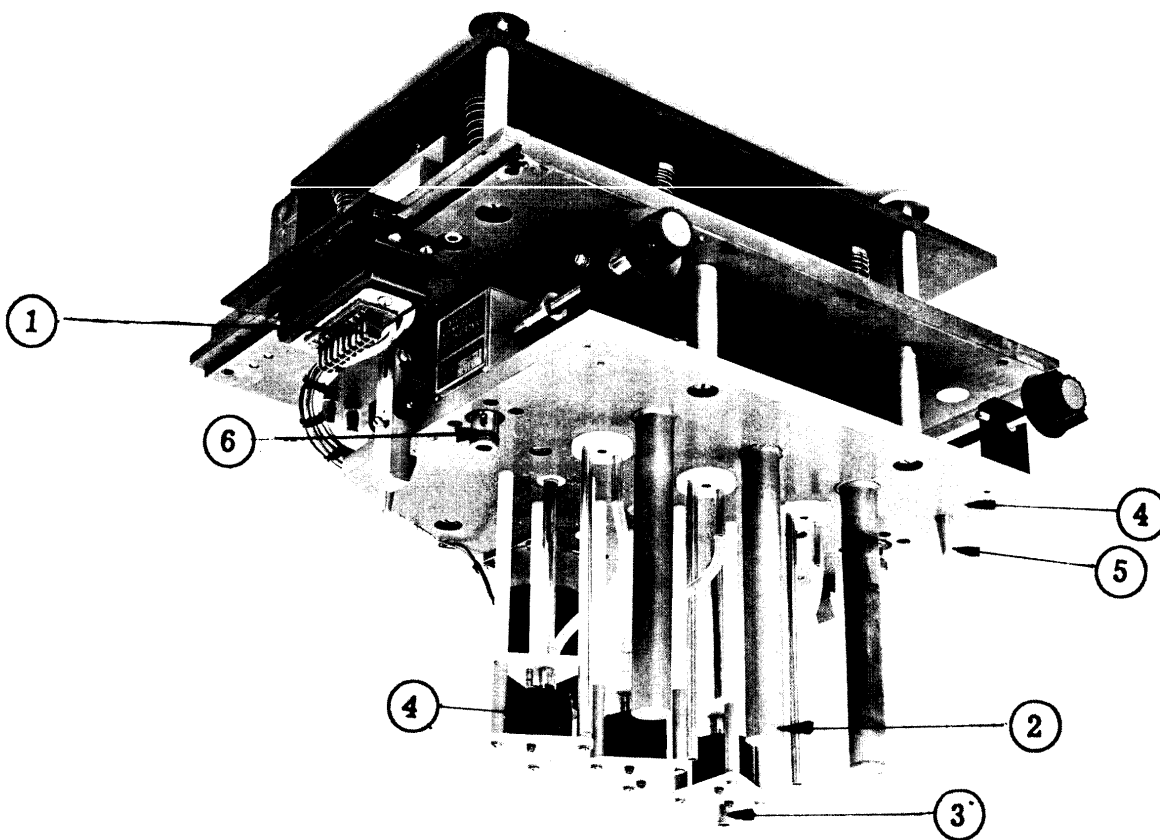


FIGURE 1-5 PROCESSING ASSEMBLY (CHEMICAL SUPPLY TANKS REMOVED)

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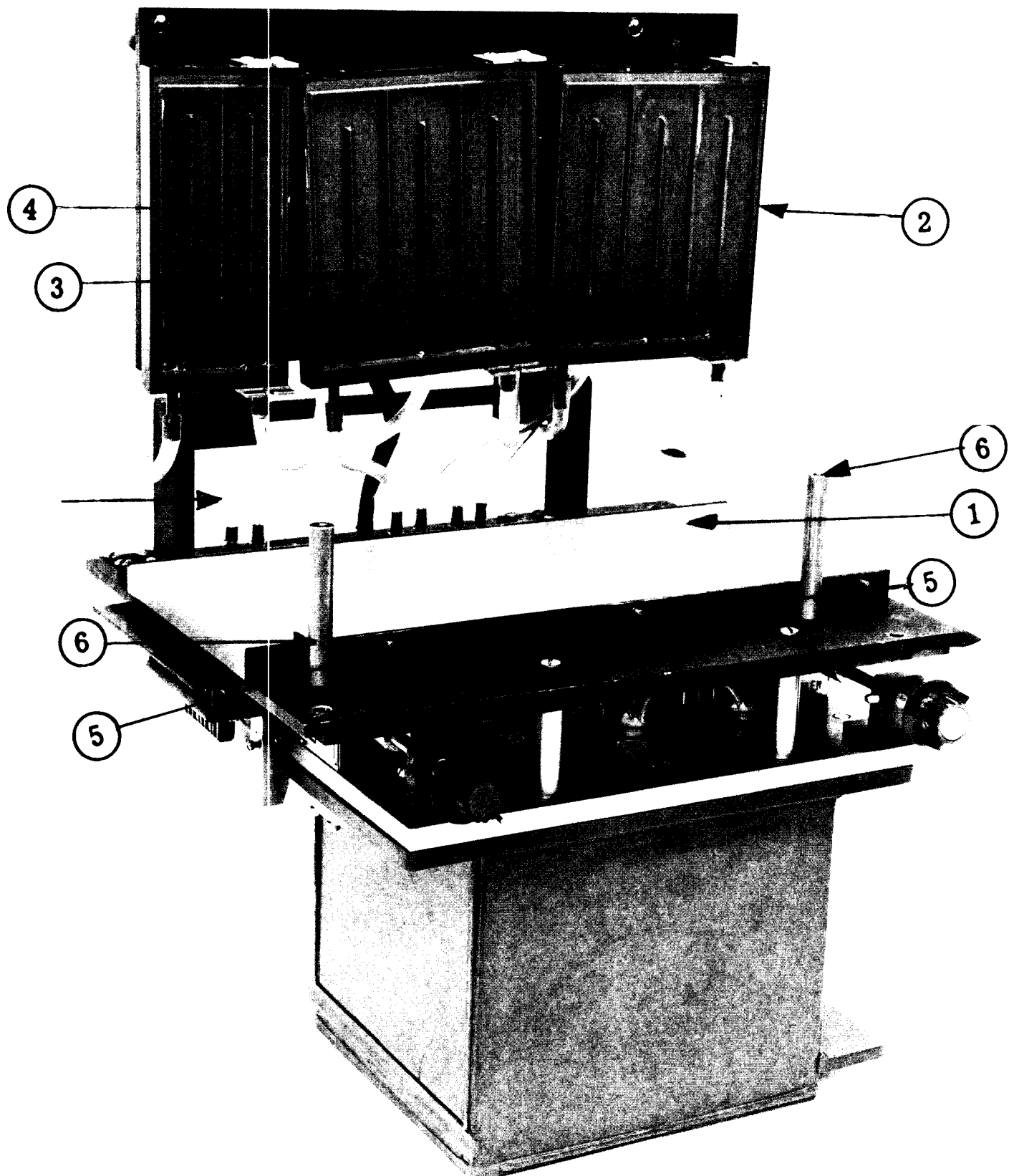


FIGURE 1-6 PROCESSING ASSEMBLY (APPLICATORS IN THREADING POSITION)

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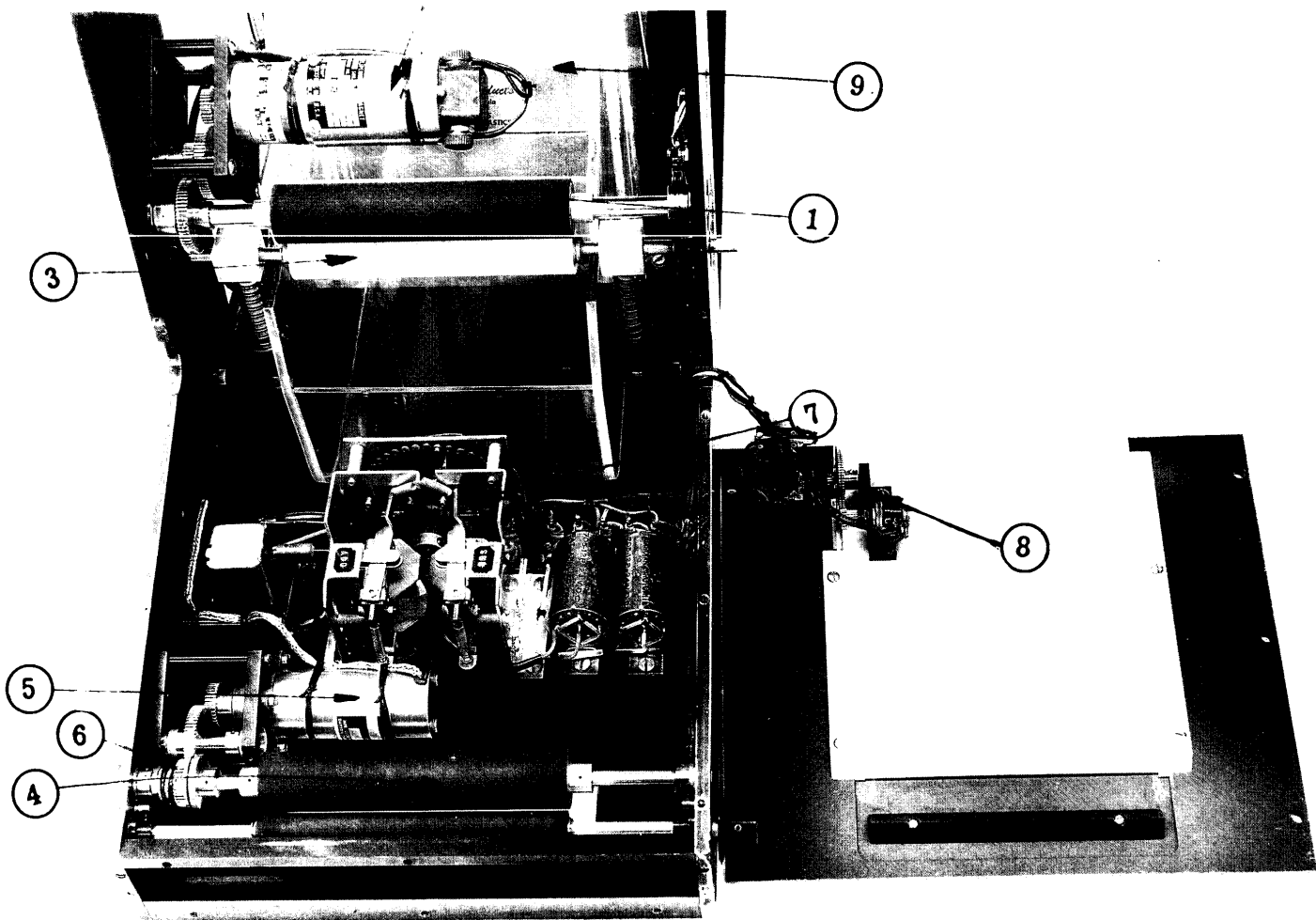


FIGURE 1-7 DRIVE MOTOR AND STEPPING SWITCH ASSEMBLY

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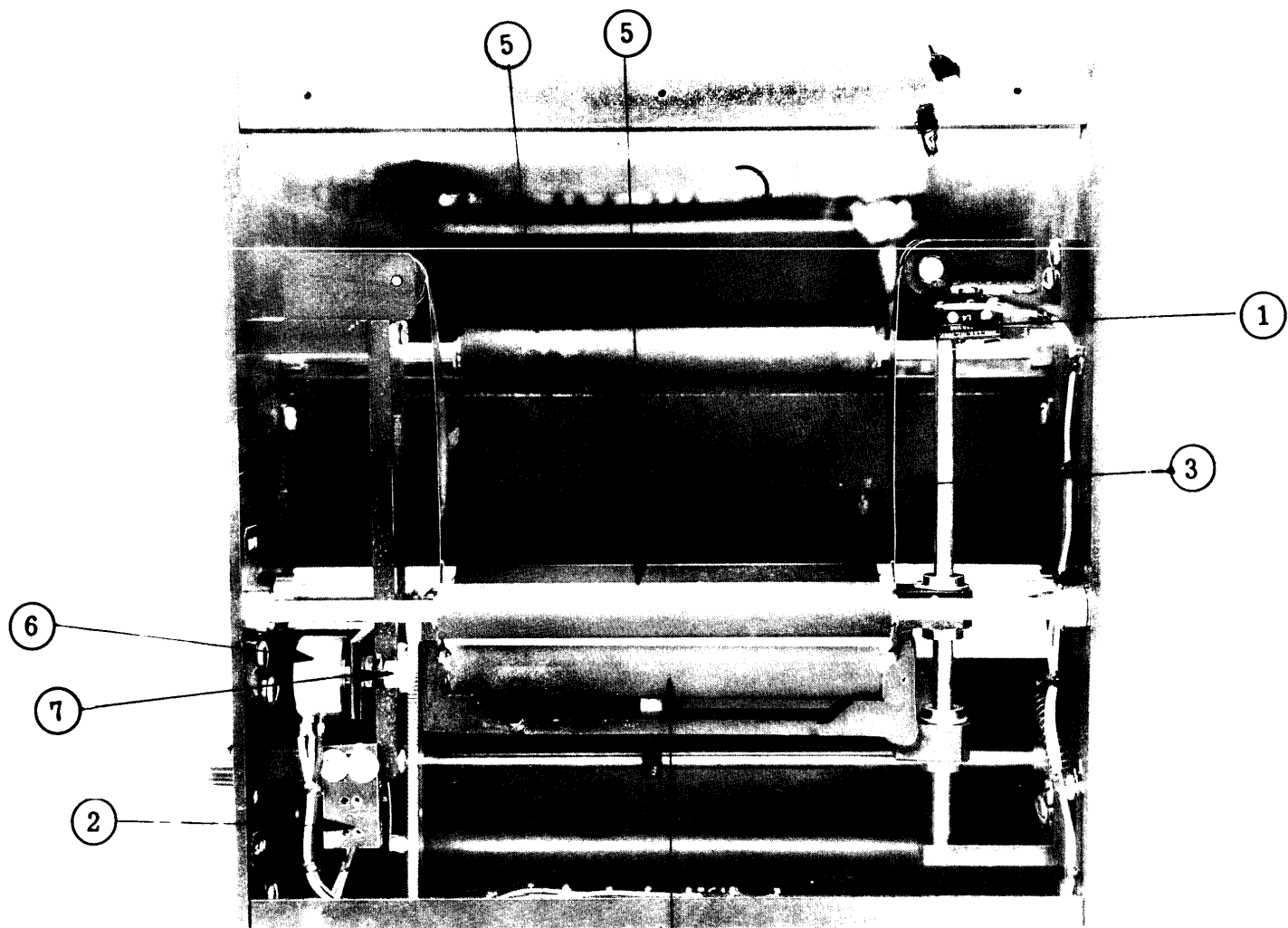


FIGURE 1-8 LOOP SENSOR MECHANISM

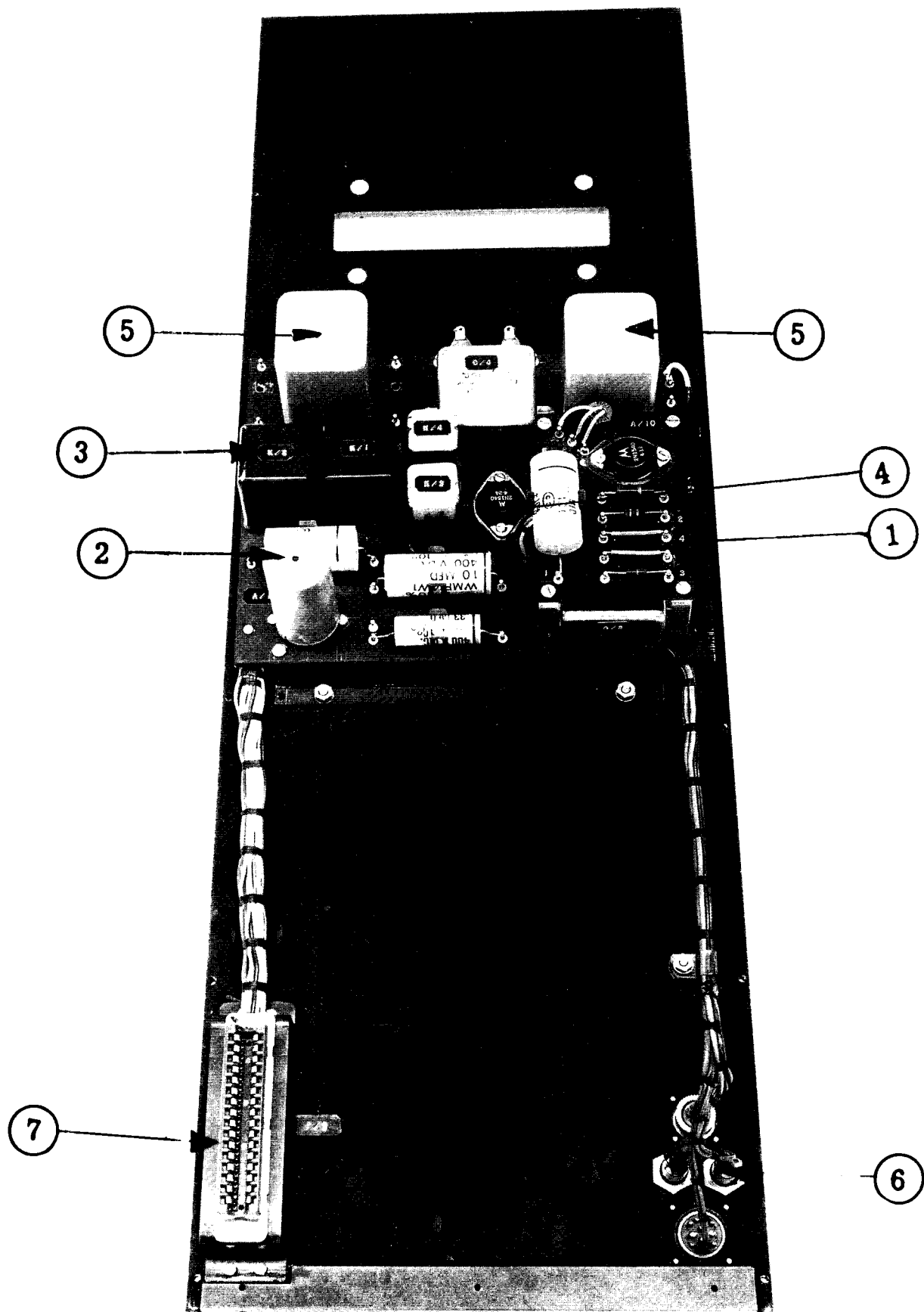


FIGURE 1-9. ELECTRONIC CHASSIS

## SECTION II.

### OPERATION

#### 2-1. GENERAL

2-2. The Rapid Access Film Processing Console is controlled entirely by external control panel mounted components. A switched line is provided by the film processor to initiate and maintain the film drive in the film recorder. Limit switches are also provided to prevent malfunction due to improper film transport.

#### 2-3. OPERATIONAL PROCEDURES

2-4. The Rapid Film Processor is considered ready for operation after being correctly installed in line with the [REDACTED] film STATINTL recorder, threaded with film, and loaded with fresh processing chemicals. Alignment between processor and recorder is critically maintained to assure proper film tracking. Installation of electrical cables from aircraft-to-processor and processor-to-recorder is also required.

POWER - Power from the aircraft is routed to the processor through the POWER switch. Initiation of the POWER switch provides 28VDC and 400 cycles to the appropriate internal components. Normally, the POWER switch should be initiated during preparation for operation.

#### 2-5. INSTALLATION

2-6. Mount - The Film Processor is designed to be mounted on a rigid frame or an equivalent structure which should also be the mount for the Film Recorder. Six (6) ¼-28 bolt holes in the bottom of the console are provided for fastening to the frame.

2-7. Dryer Air - A 2½" dryer air inlet tube (callout 2, Figure No. 1-2) is located on the right hand side of the console. This provides the entry point for air into the film drying section. Drying air may be introduced from a remote point by connecting flexible tubing (not provided) to the inlet tube. Air is discharged from the dryer to ambient just below the inlet (callout 3, Figure No. 1-2). No special provisions for exhausting dryer air are required since the water pickup from the film is relatively small.

2-8. Cables - Connect power cable to the aircraft power supply. Connect signal cable from film processor to film recorder.  
(NOTE: Power cable is provided unterminated and must be terminated

after correct length has been determined.) Single cable carries a.c. and d.c. power.

2-9. Access - Access to the Film Processor is required from the front, top and right side. Approximately 10 inches of head space above and 20 inches on the right hand side are necessary for threading and loading. Sufficient room in front for an operator to stand or sit is required for operation.

2-10. PREPARATION FOR OPERATION

2-11. LOADING AND THREADING

2-12. The film processor should be loaded and threaded in accordance with the following procedure:

2-13. LOADING CHEMICALS

a. Open chemical tank access door on right side of console by turning the gray coded knob counterclockwise.

b. Remove tank (callout 3, Figure No. 1-3), by turning the (2) red coded knobs (callout 1, Figure 1-2) clockwise until tank drops onto two (2) latches (callout 4, Figure 1-4).

c. Grip bottom of tank and depress red solenoid latch release switch (located inside of tank compartment). This will retract the two latches and permit the tank to be lowered and removed from the tank compartment. Note: If "POWER" switch is not actuated, the latches may be manually released.

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d. Fill three compartment tanks with 1 quart each of the following chemicals - [REDACTED] Developer #238B, [REDACTED] Clearing Solution #193 and [REDACTED] Rinse #174B. The compartments are labeled DEVELOPER, CLEARING, and RINSE.

Note: The processing chemicals in the solution tank should be at a temperature of 50°F or more to obviate salting-out and subsequent damage to the solution pumps upon going into operation. If salting-out is experienced the salts may be restored in solution by heating the chemicals to between 70°F and 130°F with concurrent agitation. This procedure will not impair chemical activity provided the developing solution is not unduly aerated.

e. Insert tank into tank compartment. Raise until guide pins and latches are engaged. The bottom may then be released and the tank raised to its operating position by turning the red coded knobs in a clockwise direction until securely fastened.

f. Close access door and lock into place by turning grey coded knob clockwise.



2-14. FILM TREADING (see Figure 5-3)

The "POWER" switch should be on during this procedure and sufficient film (approximately two feet) made available from the recorder to thread through the loop sensor assembly.

- a. Remove top dust cover using captive thumbscrews (callout 2, Figure 1-3).
- b. Retract and lock each of three applicators in a non-operative position. This is accomplished by lifting the knurled screws (callout 7, Figure 1-3) and applying one quarter turn.
- c. Release applicator assembly plate (callout 1, Figure 1-3) by turning two captive thumbscrews (callout 2, Figure 1-3) in the counterclockwise direction.
- d. Raise applicator assembly on its pivot bar and lock in an upright position using the locking pin located in the front pivot support. Locking is accomplished by sliding the applicator assembly toward the front of the console after it has been raised to a vertical position.
- e. Depress loop sensor roller (callout 4, Figure 1-8) to its extreme bottom position and latch in place using yellow coded knob located on right side of console.
- f. Manually feed the leading edge of the film between the two idler rollers (callout 5, Figure 1-8) and over the loop sensor roller.
- g. Using the film drive override switch in the [REDACTED] recorder to feed film from the recorder into the processor, thread the film over the processing platen, into the dryer section. Access door in dryer/viewer section should be open to facilitate threading.
- h. Retract metering roller pressure roller by turning green coded knob approximately one half turn and thread film into and out of slack box. Release pressure roller.
- i. Do NOT retract takeup roller pressure roller. Feed film through until it emerges on underside of console. Now retract pressure roller and align film in proper path. Release pressure roller.
- j. Close dryer door - threading is complete.
- k. Release loop sensor roller.
- l. Return applicator assembly plate to operating position and lock in place with two captive screws.

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- m. Place three applicators in operating position on the film by rotating knob and shaft  $\frac{1}{4}$  turn until pin drops through shaft. This is a reversal of procedure described in "b".

Note: Be sure 2 yokes (callout 5, Figure 1-3) on the sides of each applicator fit over locating pins (callout 5, Figure 1-5) in platen so that the spring loaded applicators are in intimate contact and "floating" on film.

- n. Replace dust cover.

## 2-15. WARMUP

After the processor has been loaded with chemicals and threaded, perform the following warmup procedures:

- a. Initiate "POWER" switch, if off.
- b. Initiate "HEATER" switch - yellow lamp will light to indicate chemical solutions heaters are on with full power. When chemicals have reached the correct operating temperature (approx. 120°F) the green "READY" lamp will light.
- c. Approximately sixty seconds before the processor is to be run, activate "DRYER" switch to permit the air heaters to warm up. WARNING: Do not open dryer/viewer access door while dryer blowers are activated to prevent film displacement from dryer path.
- d. Activate "PUMP" switch to establish chemical flow through the applicators.
- e. Activate "FULL" switch to reset stepping switch circuitry.

The processor is now in a condition of readiness for operation.

## 2-16. OPERATION

In the condition of readiness previously described, film will be transported, processed, dried and stored in the slack box when the "OPERATE" switch is activated. Processing will be automatic as long as film input to the processor is in the range of two inches per second within a tolerance of  $\pm 10\%$ .

## 2-17. SLACK BOX RECALL

Film may be removed from the slack box at a variable rate from 0 to 8 inches per second by means of the panel mounted

takeup control (callout 9, Figure 1-1). With the arm in a completely forward position (toward operator), recall speed is approximately 8 IPS. In the back position (toward console) recall rate is zero and all the processor film will accumulate in the black box. A detent is provided for retracting film from the slack box at a rate approximately synchronous with the nominal processing speed of 2 IPS.

#### 2-18. SLACK BOX FULL

When the slack box has accumulated approximately twenty feet of film the red "FULL" indicator lamp will warn the operator to withdraw film from the slack box. Although actual slack box capacity is in excess of 20 feet, in practice this should not be exceeded to preclude jamming of the film. Reducing the quantity of film in the slack box below 20 feet will de-energize the full indicator lamp.

#### 2-19. FILM TAKEUP

The film takeup roller is driven through an overrunning slip clutch. When all the film has been recalled from the slack box, the takeup roller will continue to drive film into the dump box as fast as it is being processed, with no accumulation in the slack box (at recall rates in excess of 2 IPS).

#### 2-20. INTERMITTENT OPERATION

The film transport function may be interrupted at will by deactivating the "OPERATE" switch. Pumps and air heaters will continue to run. For short interruptions (up to 3 minutes), it is convenient to leave these components activated in order that the processor will be maintained in a "READY" condition so that film transport may be resumed without loss of the processing capability. For longer interruptions, the applicators should be purged and the pumps and dryer deactivated. When resuming operation, go through a normal "WARMUP" procedure as described in Paragraph 2-15.

#### 2-21. PURGE

Three solenoid valves are provided for purging the chemicals from the applicator during a temporary or "End of Operation" shutdown. To purge the applicators, activate the red "PURGE" switch while the pumps are running. Maintain this condition for a period of approximately thirty seconds. During this interval the processing solution will drain back into their respective compartments within the solution tanks. Stop pumps

with "PUMPS" switch and deactivate "PURGE" switch. Applicators are now sufficiently purged so that they may be retracted, if desired.

2-22. HANDLING OF PROCESSING SECTION AFTER COMPLETION OF SCHEDULED OPERATION

Upon return to a non-operating condition at the completion of a full 120 foot run, all film will have been processed and dried. To prepare the processing section for the next 120 foot run, proceed as follows:

- a. Purge the applicators as described in paragraph 2-21.
- b. Remove dust cover and slowly retract applicator assembly as described in paragraph 2-14. A small quantity of liquid will remain on the platen and in the applicator.
- c. Using a sponge or paper towels, quickly remove residue processing chemicals from the processing platen and applicators. DRY PLATEN THOROUGHLY.
- d. Using a clean wet sponge, carefully clean the accessible surfaces of the three applicators. EXTREME CAUTION SHOULD BE EXERCISED TO PREVENT DAMAGE TO THE APPLICATOR LIPS.
- e. Clean all rubber covered rollers with a cloth (particularly metering rollers) saturated with alcohol or acetone to prevent emulsion buildup and subsequent slippage.

2-23. Storage of Rapid Processing Chemicals:

Developer - #4027-238B

Cleaning Solution - #4027-193

Rinse Solution - #4027-174B

The developer in full, well-stoppered bottles has a shelf life in excess of six months at 60 to 70°F. Sustained storage at above normal room temperature will have a detrimental effect on the developer, resulting in shortened shelf life. The developer should be stored in subdued light or preferably in darkness.

Storage conditions for the clearing and the rinse solutions are not as critical as for the developer solution. However, all solutions should be stored in full, well stoppered bottles.

High temperatures (above room temperature) are usually more harmful to the keeping qualities of photographic materials

STATINTL

than low temperatures. [REDACTED] Rapid Processing Solutions will withstand temperatures as low as  $-40^{\circ}\text{F}$  for short periods, provided they are brought to normal temperatures prior to use. At temperatures  $50^{\circ}\text{F}$  and lower, certain chemicals will begin to "salt out" in the clearing solution and in the developer solution. The chemicals will go back into solution at  $75$  to  $90^{\circ}\text{F}$  with some stirring or shaking of the bottle. No loss in processing capability is incurred.

If adverse storage conditions do exist for any length of time, the developer solution will be the first to show deterioration. A sensitometric film test is the only sure method of determining processing capability. This may be accomplished by processing an exposed sensitometric film strip in the solution in question and comparing results with an existing type, known to be of optimum quality, under processing conditions (time-temperature) identical to the test. If a sensitometric-exposure film test is impractical, any subject matter exposure will suffice provided a similar known type, of optimum quality, is available for comparison purposes. If the test film compares favorably with type, then the processing solution is good and it may be used in the processor.

#### 2-24. THEORY OF OPERATION

#### 2-25. GENERAL

For the purpose of this discussion, the Theory of Operation is divided into three parts: chemical, mechanical and electrical.

#### 2-26. CHEMICAL

The paper is rapid processed within the processor using [REDACTED] film processing chemistry, using high temperature ( $120^{\circ}\text{F}$ ) development, followed by stabilization, and producing a good quality photographic hard copy in about five seconds. The process involves three sequential applications: developer, cleaning and rinse solutions which are applied in time increments of: developer-2 seconds, clearing-2 seconds, and rinse-2 seconds.

The high energy, high caustic developer reduces the photographic latent image to metallic silver, rendering it visible. Organic restrainers in the developer limit its action such that the quality of the photographic record is not unduly influenced by variations in time-in-process, as may be experienced with variable film transport rate.

The clearing solution performs a function similar to a conventional fixing solution, except the unexposed silver

is rendered transparent rather than removed. The rinse or stabilization solution removes excess clearing solution from the emulsion surface, preventing the formation of a haze due to surface salting, and it also stabilizes the photographic image.

## 2-27. MECHANICAL

The mechanical system is comprised primarily of the components required to 1) transport paper through the processor. This includes the mechanism required to provide the input to the servo amplifier for synchronizing the processor speed to recorder speed, and 2) apply the processing chemicals to the paper.

2-28. Film Transport - The input of film to the transport system (see Figure 5-3) is through the light tight bellows. It then passes through a loop sensor roller assembly consisting of two idler rollers, a variable position loop sensor roller, which is maintained under constant tension by a neg'ator spring, and a rack and pinion drive mechanism for the potentiometer. While the film input rate is nominally a constant two inches per second, minor variations will change the position of the loop sensor roller which will, in turn, vary the potentiometer position to provide the correct command signal to the servo amplifier for any given film speed.

Idler rollers are provided on both the input and output sides of the processing section to maintain the required flat film plane on the film platen. The film metering roll drive, which is the output of the servo system, consists of a rubber covered drive roller and a spring loaded teflon pressure roller. The rubber covering has a high coefficient of friction when in contact with the film, and in conjunction with the pressure roller provides the necessary tension on the film to pull it through the processing applicators. The pressure roller is teflon covered to prevent the film from adhering as it enters the slack box.

The takeup roller drive system is similar to the metering roll drive except that it is overdriven through a friction slip clutch so that it is unnecessary to synchronize it with the metering roller.

2-29. Application of Film Processing Chemicals - Chemicals are applied to the film by means of multi-chambered rubber lined applicator, one applicator for each chemical. The lengths of the applicators are proportioned to the required time in process. Chemicals are applied to the emulsion side of the film only and within the five inch film width. Actual processed width is 4-5/8 inches.

The applicators are maintained in intimate contact with the film through the combination of light spring pressure and the suction effect of the pumps which are used to circulate the chemicals through the applicator. Sealing action is maintained even as film is being transported by the applicator. The outgoing lap of each applicator effectively squeegees the film to minimize solution carryover between applicators and into the drying section. Processing is uniform over the entire format since the high rate of recirculation of the chemicals provides excellent agitation.

Purging of the chemicals is readily accomplished by introducing air into the circulatory system and continuing pump action until all solutions have returned to their supply tanks by drainage and suction.

2-30. ELECTRICAL - The following discussion applied to the electrical functions which occur during the preparation for operation, operation and shutdown procedures. Power is routed through the equipment as follows: power from the aircraft is provided to the processor by way of connector J3 to the electronic chassis or rear panel, A7. The electronic chassis is connected to the main console A1 by connector J2. The processing or cover assembly A4 is connected to the main console by connector J1.

2-31. OFF - 115 volt 400 cycle and 28 VDC power from the aircraft are provided at connector J3, but are not routed through the processor until the "POWER" switch S1 is actuated. When the "POWER" switch is actuated, integral red lamps DS1A and DS1C are energized, indicating that 400 cycle and d.c. power is available at the appropriate operational switches.

2-32. HEATERS - Activation of the "HEATERS" switch energizes the integral yellow lamps DS2A and DS2C, indicating that the processing solutions are being heated to operating temperature. Immersion heaters R1, R2 and R3 have a full 115 volts applied to them for quick warmup. Power is applied by way of the "HEATER" switch S2 and through one set of contacts on relay K1. The heater capacities are matched to the specific heats of each solution so that the temperature rise is approximately

the same in each tank. Developer temperature is sensed by thermistor probe RT1 and varies the base voltage of the input transistor Q4 of the temperature control amplifier A11. As the temperature rises the base voltages of transistors Q4 and Q5 become equal and the current in the relay K3 decreases sufficiently to de-energize the coil. This energizes relay K1 which reduces the power input to the heaters by re-routing the 400 cycle input power through transformers T2 and T1, which reduces the voltage input to the heaters. Overall heater power consumption is reduced to approximately 1/3 of rated power.

The transfer from normal power to low power operation is indicated by the green "READY" lamps DS7A and DS7C which are integral with the "HEATERS" switch. In low power heater operation, temperature is automatically controlled by relay K4 which is energized and de-energized as the temperature of the developer solution varies. On/off control for K4 is provided by the temperature control amplifier A11. This amplifier consists of transistors Q4 and Q5 in a bridge arrangement which unbalances as the developer temperature varies. When the developer cools, low power is switched onto the heaters and will heat the chemicals until the developer reaches its preset temperature of 120-125°. Developer temperature may be varied by adjusting potentiometer R13. No temperature sensing elements are provided for the clearing and rinse solutions since their temperatures are not required to be critically maintained.

2-33. DRYER - Power to the dryer blower motors B2 and B3 and to the air heater R4 is routed through the "DRYER" switch S12. Dryer operation is indicated by the integral blue lamps DS3A and DS3C. The "DRYER" switch is used in the warmup procedure to initiate the flow of hot air through the dryer section before film transport is initiated. Dryer operation is also initiated by activating the "OPERATE" switch which will override the "DRYER" switch.

2-34. PUMP - Power to the pump motor B1 is routed through the "PUMP" switch S3. Pump operation is indicated by the integral light yellow lamps DS3A and DS3C. The "PUMP" switch is used to initiate the flow of chemicals through the applicator before film transport is initiated. Pump operation is also initiated by activating the "OPERATE" switch which will override the "PUMP" switch.

2-35. OPERATE - When the "OPERATE" and "HEATERS" switches are activated, the K2 relay is energized and power is routed to 1) the pump motor B1, 2) the dryer blower motors B2 and B3, and 3) the air heater R4 by way of the K2 relay and the "HEATERS" switch S2. If the "HEATER" switch is not activated, the pumps and dryer will be operable only if their respective switches are activated. Also, the K2 relay provides a +28VDC voltage input to the metering roller drive motor amplifier A10.



2-36. Film Drive Servo Amplifier - The film drive servo amplifier is operated closed loop to synchronize it with the film recorder film output rate. The principal electronic components in the servo loop are the servo amplifier A10, the film drive motor B4 and the loop sensor potentiometer R6. The servo amplifier consists of transistors Q1 and Q2 which act as voltage and current amplifiers respectively, to the drive motor, with the input signal provided by R6, the sensor potentiometer. Safety interlock limit switches S9 and S14 which are actuated by the loop sensor roller are provided for film transport malfunction. The lower limit switch S14 removes power from the metering roller motor and the upper limit switch removes power from the film recorder motor.

2-37. Film Takeup - The electronic components in the takeup drive system are the motor B5, transistor Q3 which is a single stage amplifier, and potentiometer R8. R8 is a panel mounted manually actuated potentiometer which is used to regulate the film takeup motor speed. The voltage from the wiper of R8 is applied to the base of the Q3 which controls the current input to the motor, thus varying the speed.

2-38. Slack Box Full Indicator - The slack box full indicator circuitry consists of 1) the differential slipping switch S-13, 2) the add and subtract stepping switches S11 and S12, 3) the panel mounted reset switch S10, 4) the add and subtract pulse switches S8 and S7, and 5) the reset solenoid K5. Switches S8 and S7 are actuated by cams on the metering roller and the film takeup roller and provide one pulse to the coils of S11 and S12. Every third pulse of S11 provides an additive pulse to S13 and every third pulse of S12 provides a subtractive pulse to S13. When the additive pulses exceed the subtractive by 26 (which is indicative of approximately 20 feet of film stored in the slack box) "FULL" indicator lamps DS6A and DS6C are energized by way of S-13 to warn the operator to withdraw film from the slack box. When sufficient film has been recalled from the slack box, the "FULL" indicator is de-energized.

Normally, the differential stepping switch S13 will not be zeroed at the completion of a run. Zeroing is accomplished by means of reset switch S10 which energizes a self-oscillating relay K5 to provide a series of additive pulses to S-13 by way of S11.

2-39. Purge - When the "PURGE" switch S-5 is activated, 28VDC power is applied to purge solenoids L1, L2 and L3 to open their self-contained valves and drain the applicators of processing solution. Indication that purging is occurring is provided by red integral lamps DS5A and DS5C.

2-40. Solenoid Actuated Latches - S-6 is a momentary contact switch which applies 28VDC power to the tank release solenoids L4 and L5.

### SECTION III.

#### SPECIAL SERVICE TOOLS AND TEST EQUIPMENT

##### 3-1. SPECIAL SERVICE TOOLS

Special service tools required to service the processor are required only to the extent that servicing is done when the processor is not mated with the film recorder. These include:

Power supply cable  
Film supply and film feed fixture

##### 3-2. TEST EQUIPMENT

The following laboratory equipment may be used for monitoring or adjusting the processor, either mated with the recorder or in the laboratory:

Thermometer, laboratory -  $+2^{\circ}\text{F}$  accuracy  
Voltmeter, [REDACTED] Model 260 or equal

##### 3-3. APPLICATION OF SPECIAL SERVICE TOOLS

3-4. Power Supply Cable - A power supply cable with a P3 connector to mate with the J3 connector on the processor is required if the equipment is operated independently of the aircraft. Wire size shall be sufficient to carry the maximum currents specified. This cable is not provided as a part of the processing equipment.

3-5. Film Supply and Film Feed Fixture - A light tight cassette and a motor driven film drive roller or the equivalent are required to conduct processing and film transport tests on the bench. Film speed should be a nominal 2.0 inches per minute  $\pm 15\%$ . This fixture is not provided.

##### 3-6. APPLICATION OF TEST EQUIPMENT

3-7. Thermometer - The thermometer is used to monitor the developing solution temperature to assure that the processing temperature is maintained within the allowable limits for satisfactory processing. Checking and adjusting as described in the MAINTENANCE section is recommended only as dictated by variations in processing sensitometry.

3-8. Voltmeter - The voltmeter is intended to monitor the voltage output of the film drive servo potentiometer R6 and is required for troubleshooting the servo system if the film drive does not remain synchronized with the film recorder drive.

## SECTION IV.

## INSPECTION AND LUBRICATION

## 4-1. INSPECTION

## 4-2. GENERAL

Inspection of the equipment shall be performed at pre-flight and at periodic intervals as indicated by the experience of operating personnel. Inspection shall be in accordance with the following:

4-3. Pre-Flight Inspection - Perform this inspection with "POWER" on, and with the processor pre-threaded with film.

<u>No.</u>	<u>Item</u>	<u>Nature of Inspection</u>
1	Slack box full reset	Depress to reset to zero ("POWER" switch on)
2	Chemical supply	Check all three compartments in the chemical tank - each should contain one quart of the required solutions.
3	Tank release knobs (2)	Check for ease of operation in locking and unlocking tank against pump drive plate.
4	Pressure roller release knobs (2)	Check to assure that pressure rollers are not retracted and are in contact with the metering roller and takeup roller.
5	Dancer latch	Check to assure this latch is released.
6	Bellows	Assure that bellows is in firm spring contact with the film recorder.
7	Operation a. Dryer	Activate "DRYER" switch and check airflow across dryer platform. Air temperature should reach at least 100°F within 60 seconds of operation. <u>Caution:</u> Do NOT open access door to monitor temperature. Monitor at air exhaust.

<u>No.</u>	<u>Item</u>	<u>Nature of Inspection</u>
7	b. Pumps	Activate "PUMPS" switch with top dust cover removed and observe chemical flow through tygon tubing. Flow should be bubble free.
	c. Operate	Activate operate switch for several seconds to verify film transport and processing.
	d. Purge	Verify correct purging action by observing flow through tygon tubing.

Normal shutdown procedures should be followed at the conclusion of operational checking.

#### 4-4. Periodic Inspection -

<u>No.</u>	<u>Item</u>	<u>Nature of Inspection</u>
1	General condition	Visually inspect all components and wiring of the processor for general condition. Repair or replace as required. Check loop sensor roller to assure freedom of motion.
2	Cleanliness	Visually inspect all components in the film transport and processor areas for broken bits of film, dust, dirt and chemical residue. Inspect applicators, purge valves, solution tubing and solution tank for dirt and dried solution contamination. Particular attention should be paid to the film metering roll. This must be thoroughly clean and free from surface contamination. Clean in accordance with handbook recommendations.
3	Processing platen	Check for damage to teflon tape and replace if damaged.
4	Adjustments	Check adjustments of following components in accordance with the recommendations covered in Section V.  Film Metering Roller Pressure Roller Developer Temperature

<u>No.</u>	<u>Item</u>	<u>Nature of Inspection</u>
5	Processor Performance	Check the processor performance by the tests outlined in Section III. Troubleshoot, repair and adjust as required.

NOTE: The Tygon tubing connected to the pumps should be replaced after approximately 50 hours of operation. Replacement tubing is supplied in the hardware kits, Part #4501-1014, supplied as spare parts.

#### 4-5. LUBRICATION

4-6. Permanent lubrication of all critical moving parts has been performed at manufacture for 500 hours of operation. Factory overhaul is recommended after 500 hours. The operation of the following components will be facilitated by occasional application of a thin coating of a light waterproof grease. Lubricant MIL G-3278 is acceptable. Apply with clean soft brush.

1. Film metering gear train.
2. Film takeup gear train.
3. Loop sensor roller ball bushing shafts.
4. Pressure roller retractor cams.

## SECTION V.

### MAINTENANCE

#### 5-1. GENERAL

5-2. The instructions presented in this section for servicing the camera system cover maintenance and repair may be accomplished by the operating activity. Wherever practical, subassemblies have been designed as serviceable or replaceable modules.

5-3. Photographic equipment, in general, requires attention with respect to cleanliness to insure optimum performance. The operational reliability of this equipment can be improved considerably by adherence to the recommended cleaning procedures.

5-4. This section should be used in conjunction with Sections III and IV to facilitate servicing of the film processor.

5-5. Cleaning. Two types of cleaning are associated with the processor, namely the removal of extraneous matter (dust, dirt, pieces of film, etc.) and the removal of processing solution residue. Particular attention should be devoted to the prompt cleaning of solution residue to prevent deterioration of metal parts and the possibility of malfunction.

5-6. Cleaning, extraneous matter. The processor with sideplates and top dust cover installed is sealed against the normal entrance of dust and dirt except as may be drawn in by the film dryer blowers or dropped into the slack box access area. The sideplates and dust cover are readily removable to provide access to the interior of the processor. The dryer section is accessible through the front access door. The exposed internal processor area should be vacuum cleaned periodically as determined by inspection and wiped or sponged free of dirt as required.

#### 5-7. Cleaning, Solution Residue -

<u>Item</u>	<u>Procedure</u>
Applicators (retracting)	Prior to raising the applicator support and pressure plate, have a damp sponge available to wipe up all solution remaining on applicators, film and processing platen IMMEDIATELY upon lifting.
Applicators (removal)	Removal of applicators is normally not required except for replacement. Applicators should be

<u>Item</u>	<u>Procedure</u>
	thoroughly wiped with sponge to remove chemical residue. Extreme care should be exercised to prevent damage to the applicator lips.
Storage	If an applicator is to be stored (non-installed), taping the applicator to a clean, dry glass plate will assist in prolonging the applicator's useful life. Do not store applicators with an accumulation of dirt on the lips.
Solution Tank (cleaning)	Drain solutions and fill all three compartments with warm water after processing 250 feet of film or less within a time period limited to 24 hours. Replace tank in processor and operate with applicator in place for two or three minutes. This will clean all the plumbing and the circulatory pumps. After approximately 20 hours of operation the circulatory system associated with the rinse solution ONLY, may be cleaned by circulating a standard hypo solution for five minutes.
Pumps	If the system has not been operated for a period of several days, chemical residue in the pumps may harden. The pumps may be released by installing a tank filled with warm water and rotating the pump shafts by finger operation to assure freedom of rotation. Do NOT apply power to a pump that does not turn freely by hand operation. Prolonged immersion in warm water should loosen dried chemical residue.
Storage	Perform normal cleanup procedure using hypo in the rinse solution. Applicator should be left installed and in contact with the film platen.
5-8. Cleaning, rollers. All rollers, particularly the metering roller, should be cleaned frequently using acetone or methyl alcohol to remove all foreign matter.	



## 5-9. TROUBLESHOOTING PROCEDURES

Preliminary to any detailed analysis of film processor failure, check that the supply voltages are applied, all connectors mated, fuses are good, and review the pre-flight and periodic inspection procedures described in Section IV of this handbook. Refer to the paragraphs in Section II of this handbook describing the theory of operation. Troubleshoot only after analyzing results of this survey.

## 5-10. INDICATOR PROBLEMS (operation otherwise normal)

<u>Trouble</u>	<u>Probable Cause</u>	<u>Remedy</u>
"Ready" indicator lamps fail to light	1. Defective lamps DS7A and DS7C 2. Defective contacts on Relay K1	1. Replace lamps 2. Replace relay
Slack box full indicator lamp fails to light	1. Defective lamp DS6A and DS6C 2. Stepping switch circuitry malfunctions 3. Cam actuating switch S8 loose on shaft 4. Defective switch S8 or actuator	1. Replace lamps 2. Check circuitry and remedy 3. Tighten set screw 4. Replace switch or actuator
Other functional indicator lamps fail to light	1. Defective lamps 2. Defective switches	1. Replace lamps 2. Replace switches

## 5-11. FILM TRANSPORT PROBLEMS

Motor speed not synchronized with film output speed of film recorder; limit switches S9 or S14 are actuated resulting in shutdown of processor and/or recorder or intermittent operation of recorder	1. Improper voltage output of potentiometer R6	1. Measure voltage output of potentiometer R6 at extremes of loop sensor roller travel. If beyond range of 12-27 volts, replace.
	2. Defective transistor Q1 or Q2	2. Replace transistor

<u>Trouble</u>	<u>Probable Cause</u>	<u>Remedy</u>
film slips on metering roller	<ol style="list-style-type: none"> <li>1. Dirty metering roller</li> <li>2. Insufficient pressure roller spring pressure</li> <li>3. Excessive applicator spring pressure</li> <li>4. Pressure roller retracted</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean metering roller</li> <li>2. Increase spring pressure</li> <li>3. Reduce applicator pressure</li> <li>4. Release pressure roller</li> </ol>
Takeup roller will not recall film from slack box	<ol style="list-style-type: none"> <li>1. Dirty takeup roller</li> <li>2. Pressure roller retracted</li> <li>3. Clutch tension too low</li> <li>4. Defective takeup motor B5</li> <li>5. Defective gear train</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean takeup roller</li> <li>2. Release pressure roller</li> <li>3. Increase clutch tension</li> <li>4. Replace motor</li> <li>5. Repair or replace gear train</li> </ol>
Film adheres to pressure rollers	<ol style="list-style-type: none"> <li>1. Tacky or dirty pressure rollers</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean pressure rollers</li> </ol>
Film jams in slack box	<ol style="list-style-type: none"> <li>1. Tacky pressure roller</li> </ol>	<ol style="list-style-type: none"> <li>2. Clean pressure roller</li> </ol>
Film not dry in slack box	<ol style="list-style-type: none"> <li>1. Excessive ambient relative humidity</li> <li>2. Excessive moisture on film leaving applicator</li> <li>3. Threading access door open</li> <li>4. No air flow</li> <li>5. Drying air not heated</li> </ol>	<ol style="list-style-type: none"> <li>1. Do not store film in slack box; transport directly to dump box</li> <li>2. Check applicators for improper seating or defective lips; replace applicator if lips are defective</li> <li>3. Close access door</li> <li>4. Check air blower &amp; associated circuitry. Correct or replace as required.</li> <li>5. Defective heater-replace.</li> </ol>

## 5-12. PROCESSING PROBLEMS

Note

The following notes assume that the exposure on the film is correct, the circulatory system is connected properly and that the solutions are installed in the proper sections within the supply tank. Check prior to troubleshooting.

<u>Trouble</u>	<u>Probable Cause</u>	<u>Remedy</u>
Light transverse streaks in the recording area	1. Excessive air bubbles in the developer section of the applicator	1. Check applicator, purge valve and circulatory system for air leaks and remedy. Check for improper seating of developer applicator.
Longitudinal streaks in the recording area	1. Low developer flow rate and/or stationary air bubble in the developer section of the applicator	1a. Check applicator and circulatory system for obstruction to flow and remedy. 1b. Replace developer pump.
Overdeveloped, or dark appearance, high fog in the areas of low exposure	1. Developer temperature high (should be 120-130°F)	1. Check developer temperature control circuitry and adjust.
Underdeveloped or light appearance of the recording	1. Developer temperature low (should be 120-130°F)	1. Check developer temperature control circuitry and adjust.
Brown stain over the recording area	1. Excessive developer in rinse solution. See NOTE above.	1. Empty all solutions from the supply tank, clean tank thoroughly, and install fresh solutions.
High overall fog in the recording area.	1. Excessive clearing solution in the developer. See NOTE above.	1a. Check applicator chamber lips for damage permitting a cross flow of solution. Replace applicator if damaged.

<u>Trouble</u>	<u>Probable Cause</u>	<u>Remedy</u>
No developed image, clear recording area	1. Excessive runaway temp for any one or all of the three processing solutions 2. Clearing solution applied before developer. See NOTE above.	1b. Empty all solutions from the supply tank, clean tank thoroughly and install fresh solutions. 1. Check temperature control circuitry and remedy. 2. Empty all solutions from the supply tank, clean tank thoroughly, and install fresh solutions.
Film developed but not completely cleared or fixed	1. Low clearing solution flow. 2. Low clearing solution temperature (should be 120°F)	1a. Check applicator, purge valve and circulatory system for air leaks and remedy. Check applicator for improper seating. 1b. Check applicator and circulatory system for obstruction to flow and remedy. 1c. Replace clearing solution pump. 2. Check clearing solution heater and replace if necessary.
Frosted or salted appearance of the record	1. Low rinse solution flow 2. Low rinse solution temperature (should be 70 - 120°F)	1a. Check applicator, purge valve and circulatory system for air leaks and remedy. Check rinse applicator for improper seating. 1b. Check applicator and circulatory system for obstruction to flow and remedy. 1c. Replace rinse solution pump. 2. Check rinse solution heater and replace if necessary.

### 5-13. REMOVAL, REPAIR AND REPLACEMENT

Servicing of the processor is best facilitated by partial or complete removal of the appropriate subassembly from the main console. All subassemblies are readily completely or partially removable and provide access to all components for servicing.

### 5-14. PROCESSING ASSEMBLY

The processing assembly is accessible from the top of the console with the dust cover removed. Complete removal is accomplished by removing four mounting screws. The processing assembly is doweled to the main frame to provide automatic alignment when the unit is reassembled. Connector P1 which provides power is a self alignment automatic disconnect type.

### 5-15. ELECTRONIC CHASSIS

The electronic chassis is mounted to the inside of the rear panel and is completely removed when the rear panel is removed. Connector P2 which is the electrical interlock between chassis and main console is an automatic disconnect type and self aligning when the rear panel is replaced.

### 5-16. DRYER AND CONTROL PANEL (see Figure 5-1)

Access to the dryer and control panel is provided by partial removal of the front panel containing the threading access door. The front panel remains tied to the main console by means of an electrical service loop. The right side panel must be removed before the dryer assembly can be withdrawn from the console.

### 5-17. FILM DRIVE MOTORS AND STEPPING SWITCHES

Access is provided by removing the review station panel which carries the takeup motor speed control potentiometer and the Slack Box Full indicator and reset switch.

### 5-18. FILM METERING ROLLER DRIVE ASSEMBLY

This assembly consists of the film metering motor and the speed reducing gearbox. It is bolted to the main frame by four screws which are accessible when the left side panel is removed. Complete removal requires disconnecting wires 3 and 4 on TB3.

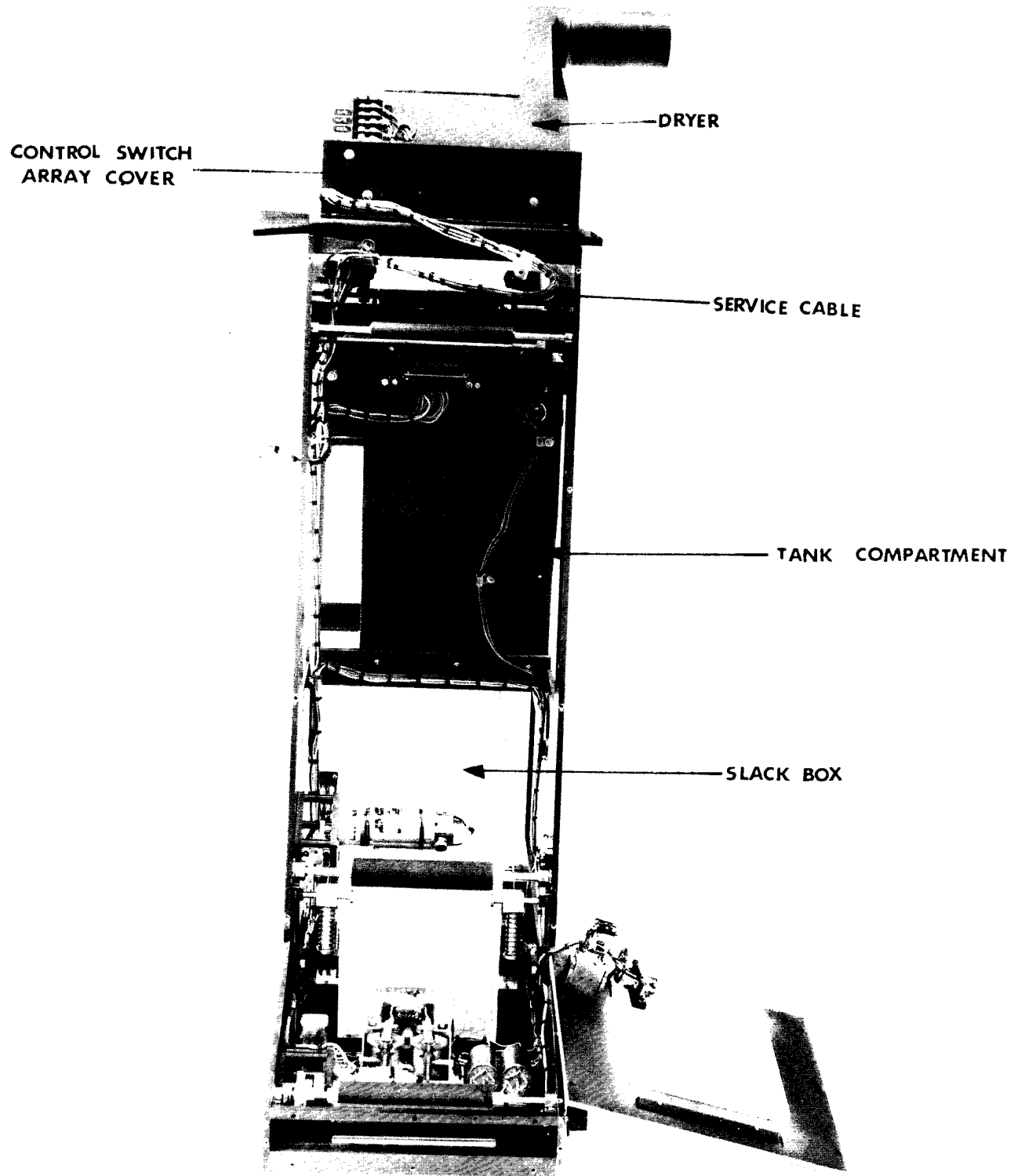


FIGURE 5-1. MAINTENANCE FRONT PANEL REMOVED

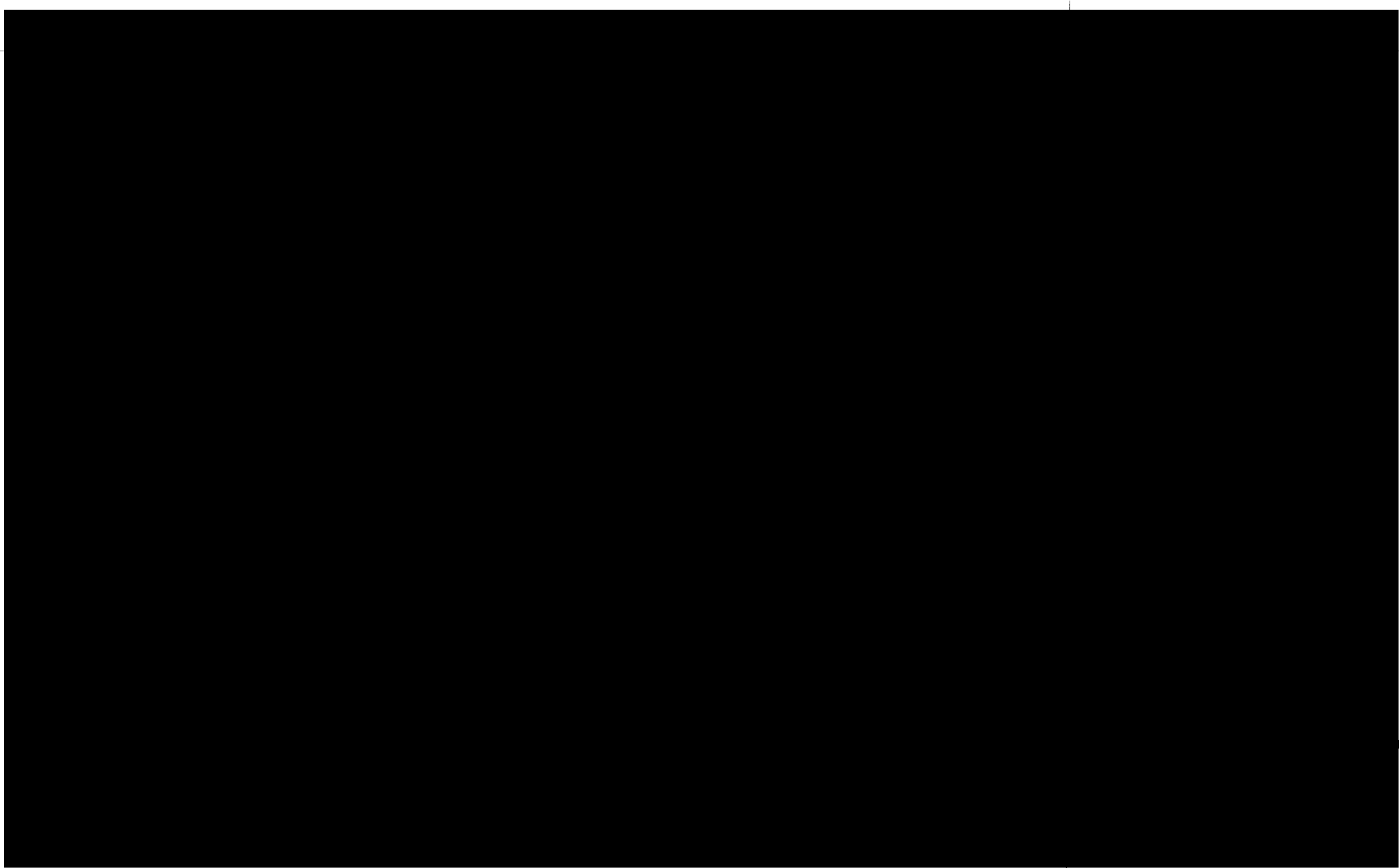
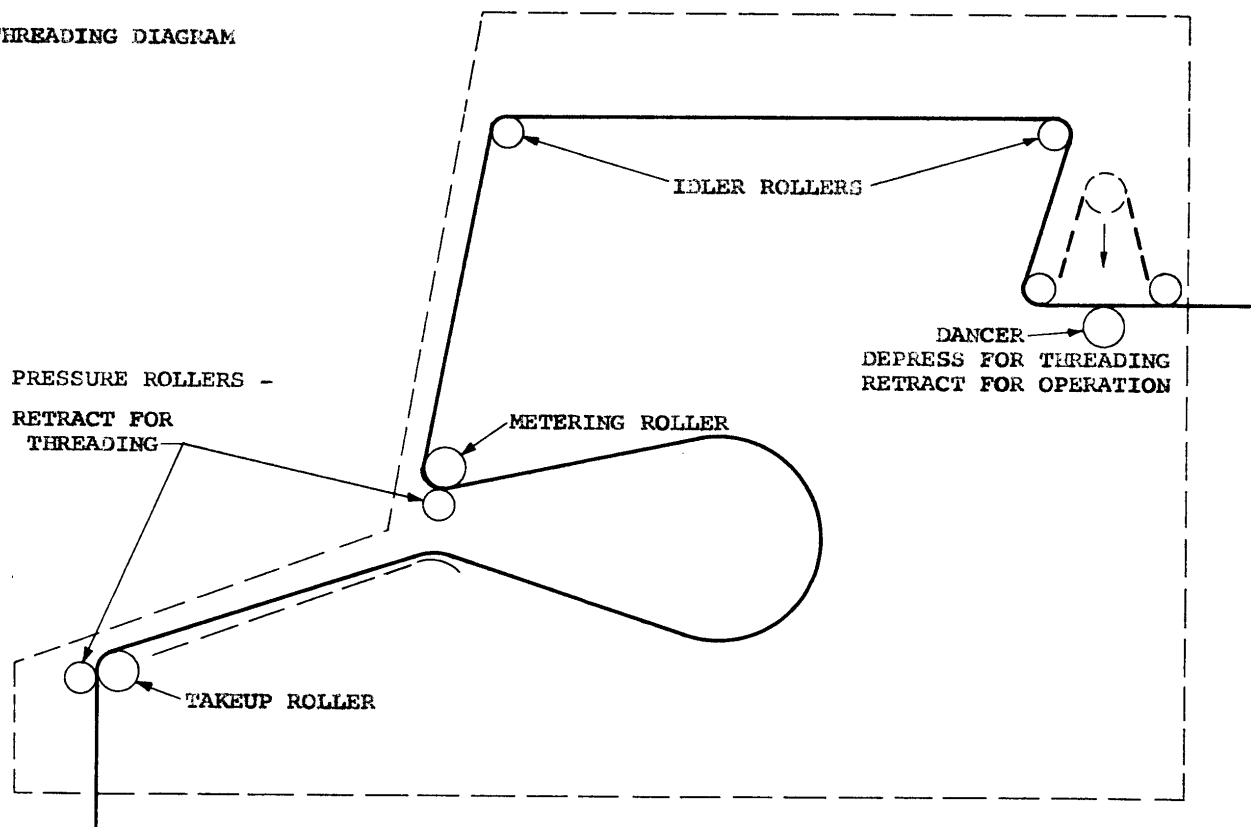
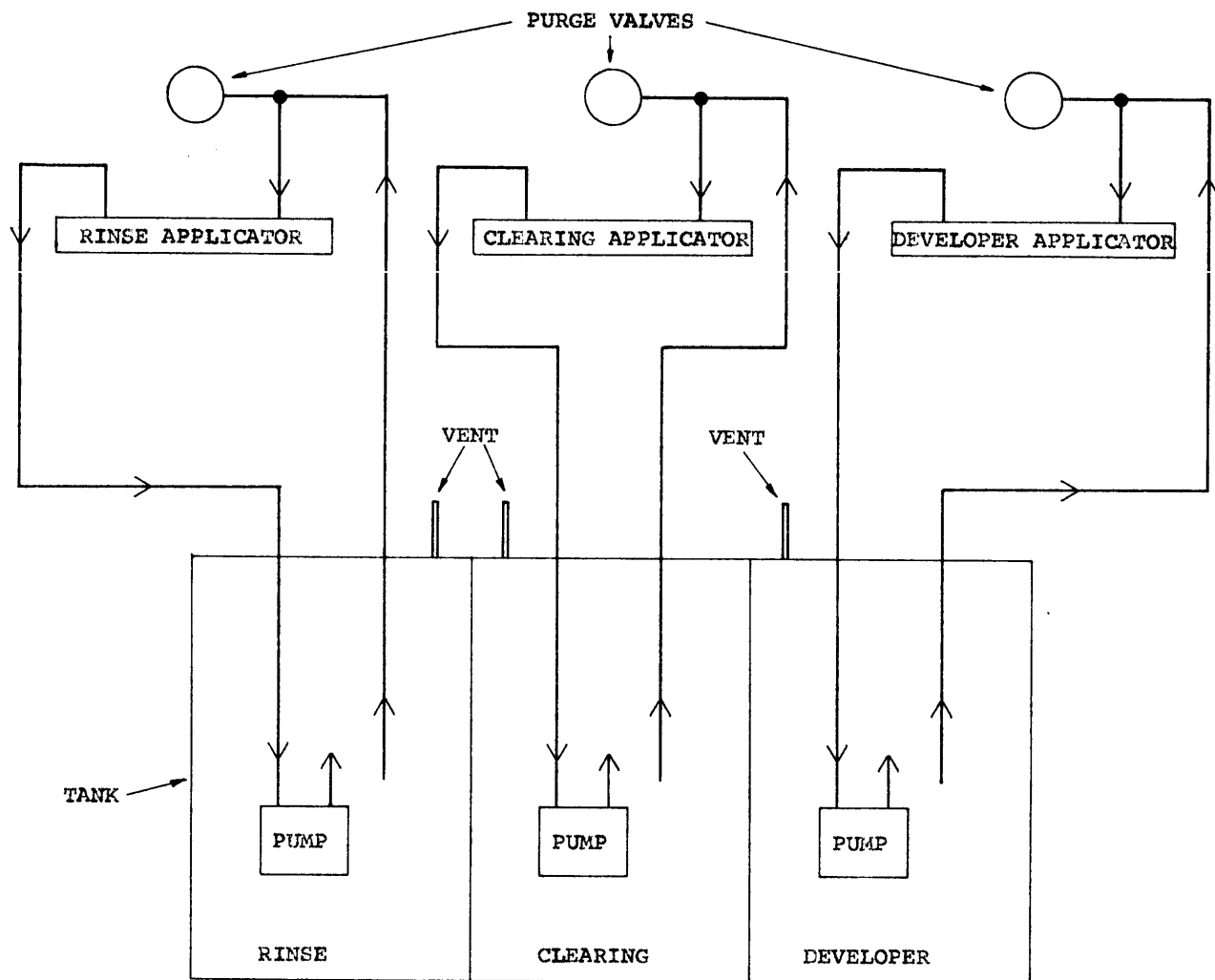


FIGURE 5-2

THREADING DIAGRAM







#### 5-19. FILM TAKEUP ROLLER DRIVE ASSEMBLY

This assembly consists of the film takeup motor and gearbox and is mounted in an identical manner as the Film Metering Roller Drive Assembly. Complete removal requires disconnecting wires 1 and 2 on TB3.

#### 5-20. ADJUSTMENTS

#### 5-21. PROCESSING SOLUTION TEMPERATURE

The processing solution temperature has been factory set at 120 - 125°F. The equipment will operate properly over a temperature range of 120-130°F. Adjustment is required only if the temperature exceeds these limits. Adjustment is accomplished by means of potentiometer R3 located on the electronic chassis under the servo amplifier.

#### 5-22. APPLICATOR

The applicator normal force spring pressure is factory set to maintain the proper contact between the applicator and film. Adjustment is required only if air leaks are introduced into the circulatory system. Increased pressure is obtained by turning the two adjusting screws (callout 2, Figure 1-3) on each applicator counterclockwise an equal amount. If more than two turns are required, the applicator lips should be inspected for damage or insufficient flatness and replaced if defective.

#### 5-23. PRESSURE ROLLER

The film metering pressure roller should be increased in pressure if applicator pressure is increased to compensate for the added tension introduced into the film transport system. This may be accomplished by turning the two adjusting screws located under the two springs in a clockwise direction.

The film takeup pressure roller does not require adjustment.

#### 5-24. FILM TAKEUP CLUTCH

Factory set at 3 - 4 pounds film tension. Reset if adjusting nut is inadvertently maladjusted.

## SECTION VI.

### PARTS LIST

#### 6-1. PART NUMBER SYSTEM

The Rapid Access Film Processing Console is comprised of three major assemblies. The major assemblies in turn consist of various subassemblies and individual components. All assemblies, subassemblies and components are identified by part numbers. The part number system identifies a unit by a two part number separated by a dash. The first group of numbers which is common to all units, indicates the manufacturing control number; in this case, 4501. Following the dash, a letter A and a number indicates an assembly. A hundred series number denotes a manufactured part and a thousand series number denotes a purchased part.

For example, Part No. 4501-A4 is a complete assembly which is in turn comprised of subassemblies such as 4501-A3, applicator assembly, manufactured parts such as 4501-102, solution tank and purchased parts such as 4501-1003, solution heater. The breakdown of assemblies is in accordance with paragraph 6-2.

The parts list is divided into two sections: mechanical and electrical. The parts listing of mechanical piece parts has been confined to the manufacturer's recommended replacement items, together with other parts which are readily identifiable and which do not require special fitting in replacement.

## 6-2. ASSEMBLIES

	<u>Assembly No.</u>	<u>Nomenclature</u>	<u>Number per Assembly</u>
A.	4501-A1	Rapid Access Film Processing Console	1
(1)	4501-A4	Processing Assembly	1
(a)	4501-A3	Applicator Assembly	1
(b)	4501-A2	Pump and Tank Assembly	1
(c)	4501-A14	Pawl Assembly	2
(d)	4501-A12	Thermistor Probe	1
(2)	4501-A7	Electronic Chassis	1
(a)	4501-A10	Film Drive Servo Amplifier	1
(b)	4501-A11	Temperature Control Module	1
(3)	4501-A6	Main Console	1
(a)	4501-A8	Takeup Drive Assembly	1
(b)	4501-A9	Metering Roll Drive Assembly	1
(c)	4501-A13	Sensor Roller Assembly	1
(d)	4501-A5	Dryer Assembly	1

## 6-3. PARTS LIST - MECHANICAL

STATINTL

Part No.	Nomenclature	Quantity	Mfd. by	Manufacturer Part No.
4501-100	Roller, Idler & Metering			same as Part No.
4501-101	Roller, Metering	2		
" -102	Tank	1		
" -103	Plate, Pump Support	3		
" -107	Drive Plate, Upper	1		
" -108	Drive Plate, Lower	1		
" -110	Spacer, Pump	9		
" -117	Cam, Metering Drive	4		
" -124	Bellows	1		
" -131	Bearing, Pump Drive	3		
" -141	Housing, Thermistor	1		
" -146	Bushing	2		
" -147	Door, Viewer/Dryer	1		
" -151	Light Seal	1		
" -155	Guide, 4" Applicator	2		
" -156	Guide, 2" Applicator	1		
" -163	Lee	3		
" -173	Spring, Applicator	6		
" -183	Rack, Loop Sensor	1		
" -189	Support	2		
" -195	Gear and Lever Assembly	1		
" -216	Film Guide	1		
" -231	Valve Connector	3		
" -232	Cutting Die	1		
" -234	Wear Plate	3		
" -1000	Ball Bearing, flanged $\frac{1}{4} \times \frac{3}{8}$	22		SR168PP
" -1001	Spur Gear, 48 Pitch, 96 teeth	1		G7-96
" -1002	Spur Gear, 48 Pitch, 48 teeth	1		G7-48
" -1004	Ball Bearing, flanged $\frac{1}{4} \times \frac{5}{8}$	4		SFR4PP
" -1005	Spur gear, 48P, 36T	2		G7-36
" -1006	Clutch, Spring	1		R3-3-50
" -1007	Gear, Disc, 48P, 60T	1		J2-60
" -1011	Applicator, 4 inch	2		
" -1012	Applicator, 2 inch	1		
" -1015	Pump	3		3400500
" -1029	Ball Bearing, flanged $\frac{1}{4} \times \frac{1}{2}$	10		SFR 188PP
" -1030	Gear, 48P 60T	2		G8-60
" -1031	Gear, 48P 30T	2		G7-30
" -1032	Ball Bushing	2		INST-4812-SS
" -1033	Neg'ator Spring	2		SH-5E15
" -1034	Bearing	1		K3L2
" -1035	Rack Dancer	1		AG-3
" -1036	Spur Gear	1		G10-25
" -1037	Right Angle Drive	2		G1566-1
" -1044	Magnetic Strip	1		$\frac{1}{2}$ wide
" -1045	Spring	2		AY-5
" -1051	Knob	3		BG-7
" -1055	Speed Control Gear	1		P-16-3-85
" -1056	Knob	2		BG-1
" -1061	Spring	2		MW-122
" -1062	Spring	2		4-031
" -1076	Ball Bearing Flanged	2		MFS3KDD

## 6-4. PARTS LIST - ELECTRICAL

STATINTL

<u>Part No.</u>	<u>Nomenclature</u>	<u>Quantity</u>	<u>Mfd. by</u>	<u>Manufacturer Part No.</u>
4501-1016	Motor, Pump Drive	1		83A109-2794
" -1017	Blower, Dryer	2		528YS
" -1008	Gearhead Motor, Takeup	1		5A2055
" -1199	Gearhead Motor, Main Drive	1		BYLM-92908
" -1024	Capacitor	1		WMF4P33
" -1025	Capacitor	1		WMF4W1
" -1023	Capacitor	2		CP5381EF205K
" -1027	Lamp	16		327
" -1020	Relay	2		FC-400-1
" -1028	Transistor	1		2N1540
" -1018	Heater Element	1		SEF-120
" -1060	Thermistor	1		CB41P2
" -1003-1	Heater, 250 watt	2		13E0100-1
" -1003-2	Heater, 140 watt	1		13E0100-2
" -1013	Valve, Purge	2		BZDA9026
" -1014	Rheostat	1		0119
" -1040	Microswitch	5		2D-26
" -1041	Microswitch	1		2DZ
" -1068	Connector	1		PT02A-14-155
" -1026	Potentiometer	1		224L-1-202
" -1042	Switch	1		2D33
" -1017-2	Clamp, Blower	6		1090/4-337
" -1057	Switch	2		11SM1
" -1058	Actuator	1		JS-2
" -1059	Actuator	1		JS-5
" -1063	Transformer	2		HS-442
" -1064	Switch	1		4001
" -A11	Temperature Control Module	1		4501-A11
" -A12	Thermistor Probe	1		4501-A12
" -1021	Relay	1		22RJC-2500-G/SIL
" -1069	Potentiometer	1		3501S
" -1071	Connector	1		DS00-7P
" -1022	Relay	1		22RJC-5000-G/SIL
" -1078	Connector	1		26-4200-16S
" -1079	Connector	1		26-4100-32P
" -2001	Capacitor	1		TA5156K035POF
" -2002	Connector	1		26-4200-16S
" -2003	Connector	1		26-4200-16P
" -2004	Stepping Switch	1		1R-RAS-115
" -2005	"	2		1R-705-12P-240
" -A10	Servo Motor Amplifier	1		4501-A11